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ABSTRACT OF THE DISCLOSURE

A method and an apparatus are provided for reducing cache memory misses in a computer that performs context switches between at least a first context and a second context. First logic identifies at least a first prefetch region in a first memory element during compilation of a computer program by the computer. Second logic identifies critical memory references within the first prefetch region during compilation. The critical memory references within the first prefetch region correspond to data that may be needed in cache memory if a context switch occurs from a process or thread associated with the second context to a process or thread associated with the first context during program execution by the computer. Third logic prefetches data associated with the identified critical memory references and stores the prefetched data in cache memory prior to a process or thread associated with the first context being resumed when a switch from the second context to the first context occurs during program execution.